Dart Aerospace Ltd.

Date: Tuesday, 10/17/2006 11:20.10 AM
User: Kim Johnston

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services
Job Number : 29043
Estimate Number : 12300
P.O. Number : N/A
This Issue : 10/17/2006 **S.O. No.** : N/A
Prsht Rev. : NC
First Issue : N/A **Type** : MACHINED PARTS
Previous Run : 28319
Written By :
Checked & Approved By : 06.10.17
Comment : Est Rev:A New Issue 06-02-28 JLM
Est Rev:B As per Rev B 06-03-30 JLM

Drawing Name : BLADE FITTING
Part Number : D3488042
Drawing Number : D3488 / DSK101
Project Number : N/A
Drawing Revision : B / ED PTD 06.10.17
Material : N/A
Due Date : 11/15/2006 **Qty:** ~~24~~ 20 **Um:** Each

Additional Product

Job Number:

Seq. #:	Machine Or Operation:	Description :
1.0	D6103003	alum billet

Comment: Qty.: 1.0000 Each(s)/Unit Total : 24.0000 Each(s)
Alluminum Round Billet D6103-003
Batch: 25572 BG 06.10.22 20

2.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE

Comment: MORI SEIKI CNC LATHE LARGE
1-Turn as per Dwg DSK 101 & Folio FA627
2-Deburr BG 06.10.22 20

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE

Comment: INSPECT PARTS AS THEY COME OFF MACHINE BG 06.10.22 20

4.0	HAAS1	HAAS CNC VERTICAL MACHINING #1

Comment: HAAS CNC VERTICAL MACHINING #1
1-Machine as per Folio FA627 & Dwg D3488 PTD
2-Deburr EN/J.G 06/12/13 18

5.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE

Comment: INSPECT PARTS AS THEY COME OFF MACHINE EN/J.G 06/12/13 18

Form: rprocess

Dart Aerospace Ltd

W/O:	WORK ORDER CHANGES						
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: D3488-042 **PAR #:** _____ **Fault Category:** Prod / ~~Machined Parts~~ **NCR:** (Yes) No **DQA:** ~~Y~~ **Date:** 07/01/03

QA: N/C Closed: ~~RK~~ **Date:** 07/01/08

NCR: 29043.	WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B — **Initial** Chief Eng	**Action Description** Chief Eng	**Sign & Date**	**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
06/12/11	* 4.0	x origin was taken wrong (operator error). Total hole pattern was shifted 0.100" Part is SCRAP once affected.	~~RH~~ per QSI 042 06.12.11	Fixed origin. Scrap / destroy and cannot Replace.	ER 06/12/11	06-12-11	~~RH~~ per QSI 042 06.12.11 see attached	06-12-11
06/12/11	# 4.0	one part # was milled at 11.0735" instead of 11.18" (±0.030)	06/12/11	Problems with machinist correcting failo's. Scrape/destroy. failo has been fixed by Eric Chamberlain.	ER 06/12/11	06-12-11	06/12/11	06-12-11

NOTE: Date & initial all entries

Date: Tuesday, 10/17/2006 11:20:10 AM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services **Drawing Name:** BLADE FITTING

Job Number: 29043 **Part Number:** D3488042

Job Number:

Seq. #:	Machine Or Operation:	Description :	
6.0	QC8	SECOND CHECK	
	Comment: SECOND CHECK		SA 06.12.13
7.0	HAND FINISHING1	HAND FINISHING RESOURCE #1	
	Comment: HAND FINISHING RESOURCE #1 Chemical Conversion Coat as per QSI 005 4.1		a.m / MR 06/12/19 (18)
8.0	POWDER COATING	POWDER COATING	
	Comment: POWDER COATING Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3		SS / M 06/12/22
9.0	QC3	INSPECT POWDER COAT/CHEMICAL CONVERSION	
	Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION		a.m 06/12/22 (18)
10.0	ALS71032225	INSERT	
	Comment: Qty.: 4.0000 Each(s)/Unit Total : 96.0000 Each(s) Pick: Qty Part Number Description Batch 4 ALS7-1032-225 Insert M19393		a.m 06/12/27 (18)
11.0	HAND FINISHING1	HAND FINISHING RESOURCE #1	
	Comment: HAND FINISHING RESOURCE #1 Install Inserts as per Dwg D3488		a.m 06/12/27 (18)
12.0	QC5	INSPECT WORK TO CURRENT STEP	
	Comment: INSPECT WORK TO CURRENT STEP		ML 07/01/02 (18)
13.0	PACKAGING 1	PACKAGING RESOURCE #1	
	Comment: PACKAGING RESOURCE #1 Identify and Stock Location: FP		ML 07/01/02 (18)

Form: rprocess

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

QA: N/C Closed: _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Date: Tuesday, 10/17/2006 11:20:10 AM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services **Drawing Name:** BLADE FITTING

Job Number: 29043 **Part Number:** D3488042

Job Number:

Seq. #:	Machine Or Operation:	Description :
14.0	QC21	FINAL INSPECTION/W/O RELEASE

(18)

Comment: FINAL INSPECTION/W/O RELEASE

10/31/03

Job Completion

11-01-03

Form: rprocess

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

QA: N/C Closed: _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	29043
Description: Blade Fitting, RH	Part Number:	D3488-2
Inspection Dwg: D3488 Rev: B		Page 1 of 1

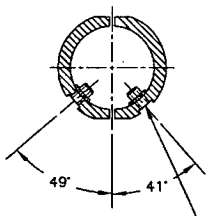
FIRST ARTICLE INSPECTION CHECKLIST

[X] First Article [ ] Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
0.125	+/-0.010	0.123	✓			
2.620	+/-0.010	2.622	✓			
0.793	+/-0.010	0.791	✓			CANNOT GET AN ACCURATE MEASUREMENT 6/12/11
1.351	+/-0.010	1.344	✓			
1.317	+/-0.010	1.320	✓			
90°	+/-0.1°	90°	✓			
1.802	+/-0.010	1.802	✓			
Ø0.508	+0.006/-0.001	0.510				
R0.062	+/-0.010	0.062	✓			
1.500	+/-0.010	1.500	✓			
8.000	+0.030/-0.000	8.03	✓			
11.18	+/-0.030	11.195	✓			
Ø0.484	+0.005/-0.001	0.484	✓			
1.180	+/-0.010	1.179	✓			
3.150	+/-0.010	3.151	✓			
h 3.070	+/-0.010	3.069	✓			
h 0.590	+/-0.010	0.591	✓			
0.125	+/-0.010	0.129				
h 1.005	+/-0.010	1.004	✓			
3.500	+/-0.010	3.497	✓			
Ø0.297	+0.005/-0.000	0297	✓			
Ø0.430	+/-0.010	0.430	✓			
0.100	+/-0.010	0.098	✓			

Measured by:		Audited by:		Prototype Approval:	N/A
Date:	06/12/11	Date:	06/12/11	Date:	N/A

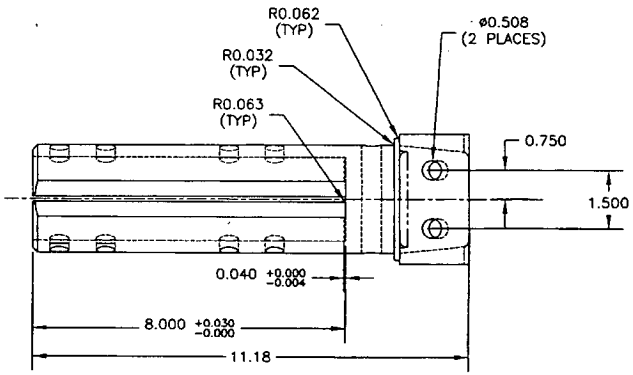
Rev	Date	Change	Revised by	Approved
A	06.03.31	New Issue	KJ/JLM	

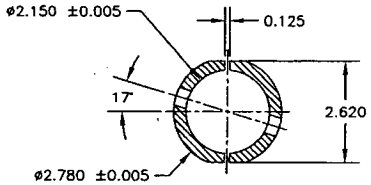


SECTION B-B

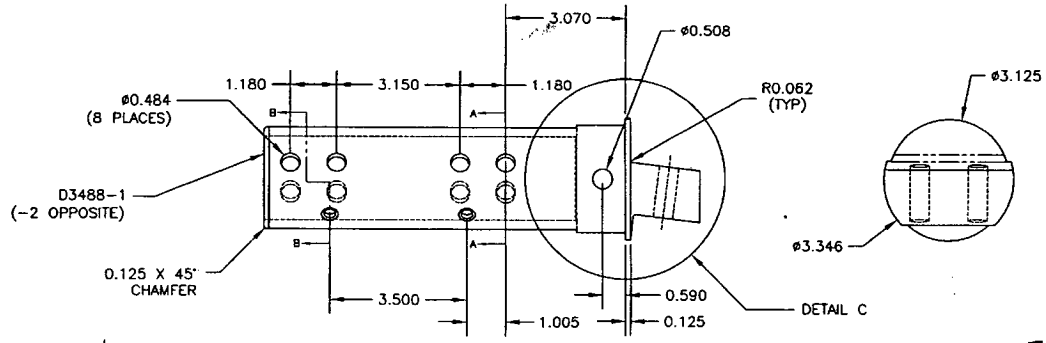
ø0.297
C'BORE ø0.430 x 0.100
INSTALL ALS4-1032-225 (OR AKS4-1032-225
OR ALS7-1032-225 OR AKS7-1032-225)
INSERTS AFTER FINISH
(4 PLACES)

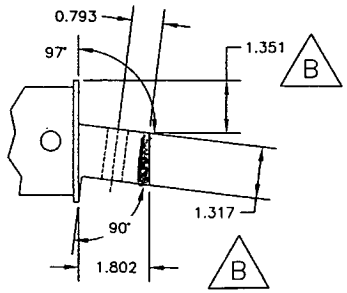
4





SECTION A-A





DETAIL C

D3488-041 SHOWN (D3488-042 OPPOSITE)

RELEASED
06.03.15 PH
PER DS
ECN #739

D3488-041/-042 BLADE FITTING ASSEMBLY PARTS LIST

QTY -041	QTY -042	PART NUMBER	DESCRIPTION
X		D3488-041	BLADE FITTING ASSEMBLY (LH)
	X	D3488-042	BLADE FITTING ASSEMBLY (RH)
1		D3488-1	BLADE FITTING (LH)
	1	D3488-2	BLADE FITTING (RH)
4	4	ALS4-1032-225 or AKS4-1032-225 or ALS7-1032-225 or AKS7-1032-225	INSERT

D3488-041/-042 BLADE FITTING

1) MATERIAL: MAKE D3488-1/-2 FROM ALUMINUM 7075-T7351 ROUND BAR PER QQ-A-225/9 (REF. DART MATERIAL SPEC M7075T73R)
2) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 POWDER COAT WHITE (REF 4.3.5.1) PER DART QSI 005 4.3
3) BREAK UNMARKED SHARP EDGES 0.010 TO 0.020
4) INSTALL INSERTS AFTER POWDER COAT
5) ALL DIMENSIONS ARE IN INCHES
6) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

0.2431
0.1485

B	06.03.15	CHANGE THICKNESS
A	05.12.20	NEW ISSUE

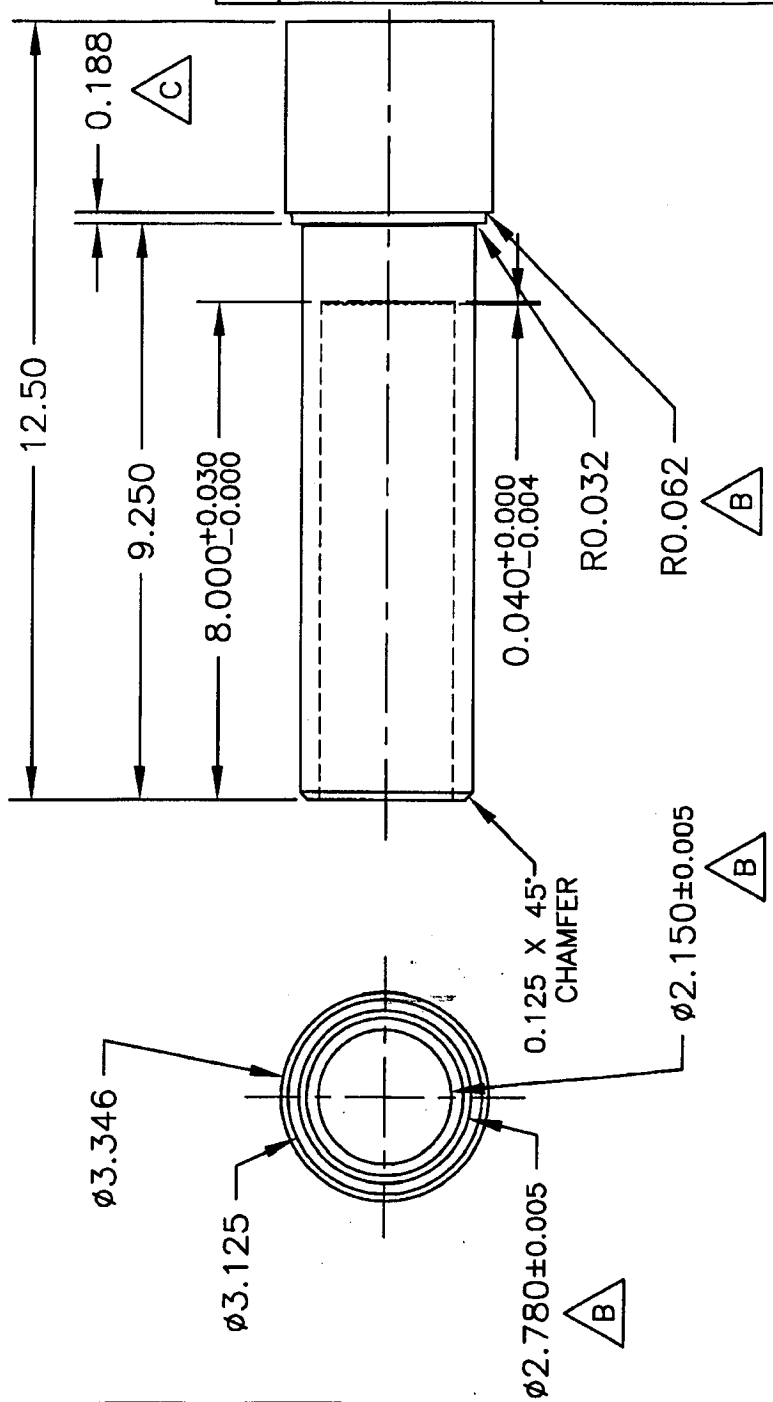
DESIGN PH	DRAWN BY PH	DART AEROSPACE USA, INC. PORT HADLOCK, WA	
CHECKED	APPROVED	DRAWING NO. D3488	REV. B
DATE 06.03.15		TITLE BLADE FITTING	SCALE 1:3
			SHEET 1 OF 1

0.580

DESIGN PH	DRAWN BY PH	DART AEROSPACE USA, INC. PORT HADLOCK, WA	
CHECKED HH	APPROVED HH	DRAWING NO. DSK 101	REV. D SHEET 1 OF 1
DATE 06.05.09		TITLE D3488-1/-2 TURNING DETAIL	SCALE 1:3

A	05.12.21	NEW ISSUE
B	06.03.02	ADD TOLERANCES AND RADIUS
C	06.04.17	0.188 WAS 0.125
D	06.05.09	REMOVE DIAMETER FOR CHAMFER

RELEASED
06-05-09 HH



SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 29043

DSK 101

1) MATERIAL: MAKE FROM ALUMINUM 7075-T7351 ROUND BAR PER QQ-A-225/9
(REF. DART MATERIAL SPEC M7075T73R)
2) FINISH: NONE
3) BREAK UNMARKED SHARP EDGES 0.010 TO 0.020
4) ALL DIMENSIONS ARE IN INCHES
5) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

L Lacelle

From: David Shepherd [dshepherd@dartaero.com]
Sent: October 23, 2006 12:26 PM
To: 'Peter Hum'
Cc: 'Serge Shahbazian'; 'Linda Lacelle (Linda Lacelle)'; 'Bill Beckett '; 'Susanne Sheldon'; 'Dale Trepanier'
Subject: RE: 350 SKIDTUBES - D3488 blade fitting

Peter,

To answer your question, I will reluctantly accept these parts. 7075-T6 has better mechanical properties than 7075-T73, but is more susceptible to SCC and because this part is on the ground and potentially installed with floats, it will be a very corrosive environment. I would not worry about trying to make 20 LH parts to match.

However, in talking to you, we should never have gotten into this situation. Looks like we didn't properly check the certs when the material showed up at the door and we made the parts before we realized the problem. I ASSUME AN NCR HAS BEEN GENERATED TO LOOK INTO THIS.

Susanne,

I think we need to have a closer look at our inspection procedures in general. I am aware of 3-4 situations in the last week where we made parts from the wrong materials or shipped the wrong hardware or shipped kits with parts installed backwards or signed off for processes that were not even completed on the parts.

David

-----Original Message-----
From: Peter Hum [mailto:phum@dartaero.com]
Sent: Monday, October 23, 2006 7:12 AM
To: 'David Shepherd'
Cc: Serge Shahbazian; Linda Lacelle (Linda Lacelle); Bill Beckett
Subject: FW: 350 SKIDTUBES - D3488 blade fitting

David,

We have manufactured the D3488-042 blade fitting used on the 350 skids using 7075-T6....the dwg calls for 7075-T73....we have accepted this before (see below, May 8 2006)

1) Is this acceptable from a strength and certification point of view?
2) If the answer to 1) is Yes would we have to make 20 LH's to match (i.e to pair everything up)?

It would be difficult to pair blade fittings up because we would have to ship 20 pairs of the D350-636 skidtubes exclusively. I am worried that customers receiving replacements will have 1 side made to T73 and another to T6.

Peter

-----Original Message-----
From: L Lacelle [mailto:llacelle@dartaero.com]
Sent: October 23, 2006 8:37 AM
To: 'Peter Hum'
Subject: RE: 350 SKIDTUBES - D3488 blade fitting

20 RH's were turned...The reason they didn't see it was the old style, was that we received one last batch of the D6103-001's at 3.5" od, instead of 3.25.....please let me know if we can still use or not Thx Linda

-----Original Message-----
From: Peter Hum [mailto:phum@dartaero.com]
Sent: October 23, 2006 8:31 AM

To: Linda Lacelle (Linda Lacelle)
Subject: FW: 350 SKIDTUBES - D3488 blade fitting

Linda,

Below are the comments from the previous conversations.....Can you e-mail me back with the qty and handed of the affected parts

Thanks
Peter

-----Original Message-----
From: David Shepherd [mailto:davids@dartaero.com]
Sent: May 8, 2006 11:25 AM
To: Peter Hum
Cc: Linda Lacelle; Bill Beckett
Subject: Re: 350 SKIDTUBES

Peter,

I DON'T think we should be using the T6 for this part.
At the last revision, we made a decision to go with T73 because of resistance to SCC.

If there is no other way around it, then I think we can use the T6, but I think we are compromising.

David

----- Original Message -----
From: "Peter Hum" <phum@dartaero.com>
To: "David Shepherd (E-mail)" <davids@dartaero.com>
Cc: "Linda Lacelle (E-mail)" <lindal@dartaero.com>
Sent: Monday, May 08, 2006 8:52 AM
Subject: FW: 350 SKIDTUBES

> David,
>
> Please read the e-mail below:
>
> Upon inspection of the attached MIL hdbk sheet for 7075, it appears
> that
the
> T6 tempering has better (stronger UTS, YTS) strength than the T73 it
> would replace.
>
> Is changing the material for this batch acceptable?
>
> Thanks,
> Peter
>
> -----Original Message-----
> From: Linda Lacelle [mailto:llacelle@dartaero.com]
> Sent: Monday, May 08, 2006 10:44 AM
> To: Peter Hum (E-mail)
> Subject: FW: 350 SKIDTUBES
>
>
> sorry, i mean T6/T6511
>
> -----Original Message-----
> From: Linda Lacelle [mailto:llacelle@dartaero.com]
> Sent: Monday, May 08, 2006 10:42 AM
> To: 'Peter Hum'
> Subject: RE: 350 SKIDTUBES
>
>
> Can we use the 7075-T73??
>
> -----Original Message-----

> From: Peter Hum [mailto:phum@dartaero.com]
> Sent: Monday, May 08, 2006 10:27 AM
> To: 'Linda Lacelle'
> Cc: Jean-Luc Menard (E-mail)
> Subject: RE: 350 SKIDTUBES
>
>
> DSK 101 REV C.
>
> Jean-Luc and I will have a look over the DSK
>
> Peter
>
> -----Original Message-----
> From: Linda Lacelle [mailto:llacelle@dartaero.com]
> Sent: Monday, May 08, 2006 10:21 AM
> To: Bill Beckett (E-mail); Peter Hum (E-mail); S Shahbazian (E-mail)
> Subject: 350 SKIDTUBES
>
>
>
> Our supplier made a mistake on the new blade fittings for the new 350
> skidtubes...he will take full responsibilty for the materia l
> (D6103-003 - $2338.00), but this leaves us with no material..I have
> checked 3 different plac4es, and the best is May 16th, then they have
> to
be
> turned , milled, and painted...so the May 15th date in stock is not
> realistic. I would also like someone to look at the drwg, it has an
> arrow over another, leaving some confusion to the ID. Our supplier has
> a machine standing by ready to turn the new billets the minute they come in.
> LL
>

Peter Hum

From: David Shepherd [dshepherd@dartaero.com]
Sent: December 11, 2006 11:28 AM
To: 'Peter Hum'
Subject: RE: D3488 part out of tolerance

Peter,

While I think we could rationalize that this part is acceptable from an airworthy point of view, it is going to look really funny from an esthetics point of view.
I recommend that we scrap the part.

David

From: Peter Hum [mailto:phum@dartaero.com]
Sent: Monday, December 11, 2006 8:49 AM
To: 'David Shepherd'
Subject: D3488 part out of tolerance

David,

The D3488 part is out of tolerance by 0.100" as shown in the attachment. This deviation will cause this part to stick out from the end by 0.100". This was due to operator error, the origin was taken at the wrong location.

Is this part scrap?

Peter

P.S. For these dispositions (over $100, per QSI 042) similar to this one, would it be appropriate to ask B Beckett?